COLUMBIA RIVER WATER MANAGEMENT GROUP
MEETING NO. 492

1. ATTENDANCE

The following met at 9:30 a.m., on Tuesday, May 12, 1998, in the Custom House, Portland, OR.

Members or Alternates Present

Lori Postlethwait, US Bur of Reclamation, Chair
Roger Ross, Corps of Engineers
Nancy Stephan, Bonneville Power Admin
Kyle Martin, National Weather Service-RFC
Dan Moore, Natural Resources Conservation Svc
Doug McChesney, Washington Dept of Ecology
Ed Hubbard, U.S. Geological Survey

Others Present

Nengjin Liu, Idaho Power Co
Michelle Schmidt, National Weather Service-RFC
Chan Modini, Corps of Engineers (NWD-NP)

Members Not Present or Represented

Walter Boyle, Federal Energy Regulatory Comm
Jack Gakstatter, U.S. Environ'l Protection Agy
Bruce McCammon, U.S. Forest Service
Marvin Yoshinaka, U.S. Fish and Wildlife Service
Bill Brooks, Bureau of Land Management
_____,National Marine Fisheries Svc
B Ondrechen, Idaho Dpt Water Resources & Cons
Barry Norris, Oregon Water Resources Dept
Mike Turnipseed, Nevada State Engineer
Gordon Fassett, Wyoming State Engineer
Jack Stults, Montana Dept of Natural Res & Cons

2. MINUTES OF LAST MEETING

The minutes of the last month's meeting, as well as future issues, will be released on the Internet (in lieu of mailed hard copy) about mid-month at:

http://www.nwd-wc.usace.army.mil/crwmg.htm.

3. WEATHER SUMMARY

Most of April was quite cold although the last week warmed to summer-like temperatures, as reported by Kyle Martin (Enc 1). Mean basin temperatures for 30 stations departed 1.0°F above normal with individual stations ranging from +4.8°F to -2.9°F from normal.

Upper air low-pressure troughs bringing cold air with clouds and rainfall from Alaska dominated the Pacific Northwest through the 20th and again on the 24th - 26th. Warm temperatures divided these storms with the month ending with an incredibly strong thermal low engulfed the region in 80-90°F weather and setting new temperature records in Portland. The snowmelt process commenced fast and furiously, resulting in minor flooding in eastern Idaho on the Portneuf River and the Henrys Fork.

Monthly and **seasonal** precipitation amounts, in percent of normal, are given below.

Basin	Apr	Oct-Apr	Basin	Apr	Oct-Apr
Above Grand Coulee	82%	83%	Kootenai	75%	91%
Above Ice Harbor 102%	95%		Clearwater	100%	84%
Above The Dalles 89%	89%		Pend Oreille/Spokane	66%	86%
Willamette	79%	95%	Rogue	109%	114%

(The RFC is still working to get their Water Supply Outlook published on their website.)

4. SNOWPACK

This year's snowpack seemed to have been saved by a productive January which provided 30% of a normal accumulation, according to Dan Moore (Enc 2 and p 12 of Enc 1). In addition, the Canadian snowpack was less affected by El Niño than it would have been, continually tracking over 10% higher than neighboring basins to the

south. During April, snowpacks, from British Columbia southward through Idaho, had their percentages-of-normal dropped significantly. The largest decreases were in the Kootenay in Canada, down 17 pts to 62% and the Spokane down 17 pts to 55% (the worst in the Columbia Basin), the Clearwater, down 7 pts to 62%. Much of Oregon's Columbia Basin dropped 5-7 pts with the John Day at 68% and the Deschutes at 83%. Other decreases were in the Boise and Payette sub-basins which dropped 3 pts to 79% and the Salmon down 1 pt to 78%. Some small gains in snowpack were seen in Wyoming, 1 pt to 92%, the Snake basin in Oregon gained 4 pts to 99%, North Cascades gained 2 pts to 106% and the Yakima gained 3 pts to 115%.

NRCS's website contains monthly summaries of precipitation, streamflow, snow pack, and other data at: **ftp://ftp.wcc.nrcs.usda.gov/support/**.

5. SWSI

Most Oregon sub-regions show only minor changes from last month and are generally in the near-normal range (Enc 3).

6. STREAMFLOW

Average April streamflows in western basins were generally decreasing and were increasing in eastern basins, according to Ed Hubbard (Enc 4). The greatest *increase* was on the MF Flathead River which rose 275% over the previous month, the greatest average flow for the year-to-date was 118% for the Snake River at Heise in eastern Idaho, and the lowest was 53% on the Wilson River near Tillamook, Oregon.

7. RUNOFF VOLUME FORECASTS

Kyle Martin reported that the forecasts decreased this month, reflecting the below normal precipitation and snowpacks. The most probable forecasts (Enc 1) varied from highs of 105% to 110% in northeastern Washington to lows of 69% in parts of the Snake River Plain. Selected forecasts for key basins in maf, are:

	January-July		**April-July**			**April-Sept**	
Columbia at Grand Coulee 53.2	(84%)				53.2	(82%)	
Snake at Lower Granite	25.6	(84%)	17.4	(80%)			
Columbia at The Dalles	89.1	(84%)				79.9	(81%)
Libby	5.20	(81%)				5.38	(79%)
Hungry Horse	1.61	(71%)				1.50	(69%)
Dworshak (NWS)	2.49	(70%)	1.73	(64%)		2.13	(74%)
Dworshak - Official (Enc 5)			1.62	(60%)			
Brownlee			4.54	(78%)			

The Corps' official Dworshak forecast procedure was developed by the NRCS and includes an El Niño factor and can be found on the Corps' NWD-WC web site at:

http://www.nwd-wc.usace.army.mil/cgi-bin/report.pl?dwrf.txt

Nengjin Liu said that Idaho Power felt that the RFC forecast for Brownlee was low, and instead is using 5.0 maf for the operation of the project.

8. RESERVOIR OPERATION

Irrigation water supply for the upcoming irrigation season is above normal, according to Lori Postlethwait (Enc 6). Grand Coulee spillway drum gate work is completed and the pool is filling, Hungry Horse is below its flood control draft point and is operating near minimum outflow, the Boise system is at 92% of capacity while the other Idaho projects are expected to fill in June, and the Yakima projects are nearing full capacity.

Active content available at the end of April at 52 irrigation reservoirs (excluding Grand Coulee and Hungry Horse) was 7,771,000 af–84% of capacity, 1,106,200 af more than last year, and 881,400 af more than normal, at

Franklin D Roosevelt Lake (Grand Coulee Dam) the active content was approximately 4,160,500 af–80% of capacity, 4,026,900 af more than last year, and 3,051,900 af more than normal, and at **Hungry Horse** the active content was 2,104,600 af–71% of capacity, 1,209,900 af more than last year, and 508,600 af more than normal.

Chan Modini reported on the operation of the Corps' projects (Enc 7). **Libby** spent most of April at minimum outflow and will increase this week to 15 kcfs until the river temperatures at Bonners Ferry reach 10°C (50°F) at which time the first sturgeon flow of 25 kcfs will be released for a 21 days. Lake Pend Oreille **(Albeni Falls)** is currently filling from the spring freshet. **Dworshak** discharged minimum outflow except for a brief period after the 19th when flows were increased to 10 kcfs to meet fish flow requirements. The **Lower Snake Projects, Ice Harbor, Lower Monumental**, **Little Goose, and Lower Granite** were drafted in early April to operate at their minimum operating pool (mop) levels (**Ice Harbor** operates one foot higher because of a navigation constraint below Lower Monumental.

The **Willamette basin projects** have filled to at or near their maximum conservation level. Exceptions are Blue River and Fall Creek which are expected to fill later and Foster which has been purposely held at its winter pool level to aid downstream migrating wild steelhead. After May 19 it will be filled with water from Green Peter Reservoir.

Brownlee pool is at 2076.9 ft and operating towards its target flood control elevation of 2077.0 ft, according to Nengjin Liu.

9. POWER OPERATIONS

On April 30 the Federal System of reservoirs was at 47.0% of full storage capacity and the Coordinated System was 47.6% of full, according to Nancy Stephan. The net monthly energy delivery over the Pacific North-west/Southwest intertie was from the north to south with a net delivery of 1,251,238 MWh. System firm loads ran near the estimate at 93.0% (after correction for temperature deviation from normal).

10. STATES

The Washington state statutory requirement to declare a drought if the water supply is 75% or less of normal led to the drought declaration on the Okanogan River at Zosel Dam, according to Doug McChesney.

11. HYDROMET

The Imnaha River at Imnaha, Oregon, is in need of additional funding. Ed Hubbard said that the gage structure was rebuilt this last year but now needs more financial sponsors to keep it in operation. Current funding ran out earlier this year so without additional funding the USGS will have to cease its operation at the end of the fiscal year.

12. OTHER

After many fits and starts the Blue Book (CRWMG Annual Report) is finally available on the Internet (no mailed hard copies). Many surprises were found when making the transparent conversion to Adobe. It will be found under Reports at the address given in Section 2, above.

Two suggestions were made for the travel meeting: (1) delay the meeting until November and visit the Vernita Bar redds along with a visit of WNP2 and (2) visit the various fish activities at the four lower Columbia dams plus Ice Harbor. The decision was for option 2 with a visit to WNP2 if time permits. Those interested in making the trip should contact Roger Ross at 503-808-3958 or e-mail at roger.l.ross@usace.army.mil. Details of the trip will be with the agenda on the web site.

A great inconsistency exists in reports in the use of the terms “normal”, “mean”, and “average.” Confusion would be reduced if their true meanings were followed: “normal” is an arithmetic mean for an accepted standard time period (for example 1961-90), “average” is an arithmetic mean for any time period, and “mean” in a general term for describing various types of central tendency of data.

The question was raised if the CRWMG should continue to meet monthly in light of low attendance and the proliferation of other gatherings discussing similar topics. Has it out lived it usefulness? Bi-monthly, quarterly, or monthly reports via e-mail might all suffice. Thoughts on this will be discussed at the June and July meetings.

13. NEXT MEETINGS

The next meetings are tentatively scheduled on June 11 at a time and site to be announced, and on July 14 at 9:30 am, in the Custom House, Room 118.

Roger L. Ross
Secretary

Enclosures

1. Weather Summary
    a. Monthly Precipitation Map -- Not available at this time.
    b. Monthly Temperature Map -- Not available at this time.
    c. Seasonal Precipitation Map -- Not available at this time.
    d. Columbia Basin Monthly Precipitation Summary
    e. Seasonal Water Supply Forecast
    f. Columbia Basin Peak Forecast
    g. Streamflow Forecasts Map
2. Snowpack Summary
    a. Columbia Basin Snowpack Summary
    b. Mountain Snow Water Equivalent Map
    c. Sub-Basin Snowpack Graphs
3. SWSI Oregon
4. Streamflow Summary
5. Dworshak Forecast
6. USBR Project Summary
    a. Upper Snake Teacup
    b. Boise Teacup
    c. Project Summary
    d. Yakima Summary
7. Corps Project Summary

ABRIDGED

WATER SUPPLY OUTLOOK

COLUMBIA RIVER AND PACIFIC COAST BASINS

May 1, 1998

COLLABORATIVE AND SUPPORTIVE AGENCIES:

Northwest River Forecast Center, NWS
USDA/National Resource Conservation Service
US Army Corps of Engineers, North Pacific Division
US Bureau of Reclamation
British Columbia Hydro and Power Authority
Weather Services Directorate/Environment Canada
Local water district managers and utility companies

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For more information, or to be included on the mailing list, please contact:

Northwest River Forecast Center
NOAA/National Weather Service
Attn: Tom Fero, Water Supply Coordinator or
Kyle Martin, ***Water Supply Outlook*** Technical Editor
Judith L. Garbutt, ***Water Supply Outlook*** Production Editor
5241 NE 122nd Avenue
Portland, Oregon 97230-1089

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US GEOLOGICAL SURVEY, WATER RESOURCES DIVISION

Oregon District

COMPARATIVE FLOW TABLE FOR APRIL, 1998

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	Monthly mean discharge		Change in discharge from previous month (percent)	Discharge near end of month		Accumulated Runoff
	Cubic feet per second	Percent of normal		Cubic feet per second	Date	Oct-Apr Percent of normal
John Day River at Service Creek, OR	4,654	93	+6	6,600	29	88
Wilson River nr Tillamook, OR	559	53	-65	301	30	113
Umpqua River nr Elkton, OR	7,622	86	-46	6,685	30	88
Columbia River at The Dalles, OR	222,900(a)	102	+56	238,000	30	110
Willamette River at Salem, OR	22,970(a)	81	-40	13,780	30	92
Chehalis River nr Grand Mound, WA	1,755	62	-63	1,110	30	114
Skykomish River nr Gold Bar, WA	3,539	84	0	10,200	30	106
Spokane River at Spokane, WA	11,030	74	+21	11,090	30	91
Snake River at Heise, ID	6,884(a)	109	+69	12,900	30	118
Snake River at Weiser, ID	29,503	105	+9	27,500	30	109
Salmon River at White Bird, ID	10,954	97	+62	21,800	30	103
Clearwater River at Spalding, ID	22,069	80	+58	36,100	30	90
Clark Fork at St. Regis, MT	7,365	82	+79	12,100	30	87
MF Flathead River nr West Glacier, MT	3,189	103	+257	8,060	30	95

Percent of Average computed using 30-year base period, Water Years 1961-90

(a) adjusted for upstream storage 05/11/98

CORPS OF ENGINEERS, NORTH PACIFIC DIVISION
REPORT FOR MAY 1998 CRWMG MEETING

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Libby.

The reservoir began April at elevation 2391.6 feet. The average outflows for the month of April were 4.0 kcfs which is minimum flow. The elevation at the end of April was 2399.6 feet. The project is expected to release minimum flow until the USFWS requests a full powerhouse sturgeon pulse in May. The USFWS has indicated they will request one pulse when the water temperature increases to about 10 degrees Celcius at Bonners Ferry, they see sturgeon movement near Bonners Ferry and the Bonners Ferry flows are elevated. Inflows in the month of April averaged 8.0 kcfs, 103 percent of normal. The May final volume forecast for April – August is 5.06 MAF, which is 79 % of normal.

Albeni Falls.

In September, Lake Pend Oreille started drafting from full (2062.5') to 2055' by mid-November. This is the second year of a three year study during which Lake Pend Oreille will only be drafted to 2055' rather than 2051' to see if kokanee will spawn at higher elevations in cleaner gravels. The operating range 1 January – 30 April was 2055' - 2056'. The project is currently filling and is expected to reach full (2062.5') by the end of May.. The average outflows in April were 21.2 kcfs. The unregulated inflow to Lake Pend Oreille in April was 29.3kcfs, 84% of normal. The May final volume forecast for April – August is 8.93 MAF, 65% of normal.

Dworshak.

Dworshak elevation reached 1500' at the end of August and remained at this elevation through 1 December to facilitate grouting work to slow down seepage through the dam. Outflows were at minimum flow (1.3 kcfs) 1 December - 19 April to fill the project as much as possible. The Salmon Managers requested flow augmentation water for Lower Granite and flows were increased to full load (9.9 kcfs, 450 MW) on 19 April. Full load continued through 30 April until the natural inflows to Lower Granite increased dramatically. Outflows were reduced to minimum flow again (1.3 kcfs) on 2 April and will be adjusted if needed to keep Lower Granite inflows from sagging too much. Actual elevation at the beginning and end of April was 1529.4 feet and 1561.9 feet. Inflow in April was 8.6 kcfs, 77% of normal. The May final volume forecast for April – July was 1.62 MAF, 60% of normal .

Lower Snake Projects.

Lower Granite April inflows were 65.2 kcfs, 100% of normal. Lower Granite, Little Goose and Lower Monumental and Ice Harbor were drafted to Minimum Operating Pool (MOP) between 6 and 9 April, and are operating between MOP and MOP + 1' (733' – 734', 633' – 634', and 537' – 538'). Ice Harbor was drafted at that same time and is operating between MOP + 1' and MOP + 2' (438' – 439') because there is a high spot in the navigation channel below LMN that prevents a 14' channel when the project is at MOP. Voluntary spill started on all Lower Snake projects the evening of 6 April. Unregulated inflow in April ws 79.2 kcfs, 100% of normal. The May final volume forecast (April – July) for Lower Granite was 17.4 MAF, 80% of normal .

Willamette Basin Projects.

Willamette projects are nearing the end of the fill schedule. The Willamette Basin snowpack has decreased to 76% of normal, while April precipitation was about 67% of normal. Precipitation since October 1 has been 91% of normal in the Valley. Fern Ridge, Detroit, and Cougar have reached maximum conservation pool and are passing inflow. Hills Creek, Lookout Point, and Green Peter will reach maximum conservation pool within the week. Fall Creek and Blue River have fallen behind their fill schedule, but are expected to fill. Foster has been drawn down to winter pool (elevation 614.0') to aid in the downstream migration of wild juvenile steelhead. The project will be held there until 19 May. Using storage from Green Peter, Foster will be full by May 22 for Memorial Day weekend.

ZCZC PDXESGPDR
TTAA00 KPDR 090104
PEAK FLOW/STAGE FORECAST
NATIONAL WEATHER SERVICE
NW RIVER FORECAST CENTER
5/8/98 MAY FINAL FORECAST
COLUMBIA BASIN ***** PROBABLE RANGE *****

STATION	FLOOD STAGE (FEET)	LOW STAGE (FEET)	HIGH STAGE (FEET)	LOW FLOW (KCFS)	HIGH FLOW (KCFS)
COLUMBIA RIVER					
PRIEST RAPIDS - WASH.	32.0	17.2	21.4	137.9	197.9
THE DALLES				206.6	286.6
VANCOUVER	16.0	7.8	11.8		
WILLAMETTE RIVER					
PORTLAND - OREGON	18.0	7.3	11.3		
CLARK FORK					
MISSOULA (ABOVE) - MT.	11.0	6.0	9.6	6.9	16.7
ST. REGIS - MT.	19.0	10.6	13.6	15.9	28.5
FLATHEAD RIVER					
COLUMBIA FALLS - MT.	14.0	9.2	12.6	23.3	43.2
PEND OREILLE RIVER					
NEWPORT - WASHINGTON	100KCFS			30.5	50.5
SPOKANE RIVER					
SPOKANE - WA.	27.0	23.2	24.8	15.0	21.0
OKANOGAN RIVER					
TONASKET - WA.	15.0	11.4	14.0	10.4	16.8
WENATCHEE RIVER					
PESHASTIN - WA.	13.0	8.8	11.0	12.0	17.8
YAKIMA RIVER					
PARKER (NR) - WA.	10.0	7.0	8.6	9.7	15.7
SNAKE RIVER					
LOWER GRANITE - WA.				108.4	192.4
HENRYS FORK					
REXBURG - ID.	9.0	8.6	9.6	6.0	8.5
PAYETTE RIVER					
EMMETT - ID.	16KCFS	6.8	10.2	7.8	15.6
SALMON RIVER					
WHITEBIRD - ID.	32.0	25.6	28.8	53.8	74.5
CLEARWATER RIVER					
SPALDING - ID.	18.0	9.4	13.4	31.0	64.8

PEAK FORECASTS PREDICT THE RANGE OF THE 67% CHANCE (1-SIGMA ABOUT THE MEDIAN) OF OCCURRENCE. ABNORMAL WEATHER DURING THE CRITICAL MELT PERIOD MAY CAUSE THE PEAK TO BE OUTSIDE THE INDICATED RANGE.

end/nwrfc/km

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ZCZC PDXRRMPD2
TTAA00 KPDR 080059

NORTHWEST RIVER FORECAST CENTER - PORTLAND, OREGON

COLUMBIA BASIN PRECIPITATION (MONTHLY SUMMARY)

NWS PORTLAND RIVER FORECAST CENTER
COLUMBIA BASIN DIVISION AVERAGES OF SEASONAL PRECIPITATION

DIVISION	..APR TO DAY 30.. OBSD	DEP	PCT AV	....OCT - APR.... OBSD	DEP	PCT AV
COLUMBIA ABOVE COULEE	1.31	-.29	82.	13.34	-2.78	83.
SNAKE RV AB ICE HARBOR	1.46	.03	102.	11.21	-.63	95.
COLUMBIA AB THE DALLES	1.42	-.18	89.	14.23	-1.70	89.
COLUMBIA AB CASTLEGAR	1.45	-.48	75.	20.07	-2.03	91.
KOOTENAI	1.26	-.36	78.	13.07	-3.19	80.
CLARK FORK	1.23	.00	100.	8.26	-2.19	79.
FLATHEAD	1.58	.01	101.	10.76	-3.25	77.
PEND OREILLE/ SPOKANE	1.40	-.74	66.	18.80	-3.06	86.
NORTHEAST WASHINGTON	1.43	.08	106.	12.31	.17	101.
OKANOGAN	1.33	.34	134.	11.06	1.47	115.
EAST SLOPES WASH CASC.	1.52	-.58	72.	32.27	-.62	98.
CENTRAL WASHINGTON	.31	-.32	50.	6.64	.26	104.
UPPER SNAKE	1.51	-.10	94.	12.77	-.11	99.
SNAKE RIVER PLAIN	.62	-.41	60.	6.07	-1.00	86.
OWYHEE/ MALHEUR	1.48	.57	162.	8.28	.69	109.
SALMON/ BOISE/ PAYETTE	1.37	-.14	91.	13.07	-1.52	90.
BURNT/ GRANDE RONDE	1.56	.33	127.	10.28	-.70	94.
CLEARWATER	2.60	-.01	100.	17.94	-3.48	84.
SOUTHEAST WASHINGTON	1.27	-.22	85.	11.80	-1.69	87.
UPPER JOHN DAY	1.20	.03	103.	9.28	-.95	91.
UMATILLA/ LWR JOHN DAY	1.11	-.30	79.	11.92	.15	101.
UPR DESCHUTES/ CROOKED	.87	.01	102.	10.90	-.29	97.
HOOD/ LOWER DESCHUTES	1.79	-.19	91.	21.61	-2.15	91.
NW SLOPE WASH CASCADES	2.56	-3.65	41.	65.09	-5.62	92.
SW WA CASCADES/COWLITZ	2.31	-2.66	46.	55.45	-2.48	96.
WILLAMETTE VALLEY	3.38	-.91	79.	47.08	-2.45	95.
ROGUE/ UMPQUA	2.63	.21	109.	35.23	4.41	114.
KLAMATH BASIN	.75	-.26	74.	16.55	1.97	113.
LAKE COUNTY-GOOSE LAKE	.95	-.04	96.	8.93	.11	101.
HARNEY/ MALHEUR BASIN	1.42	.57	167.	9.88	1.67	120.

DIVISION VALUES ARE COMPUTED BY UTILIZING UN-WEIGHTED PRECIPITATION
AMOUNTS FROM KEY STATIONS IN EACH AREA. NORMALS BASED ON 1961-1990.
FOR FURTHER INFORMATION CONTACT: NWRFC (503) 326-7291.

THE PACIFIC NORTHWEST JUMPED FROM WINTER TO SUMMER ALMOST
OVERNIGHT. MOST OF APRIL WAS QUITE COLD, THEN THE LAST WEEK WARMED
TO SUMMER-LIKE TEMPERATURES.

MEAN TEMPERATURES DEPARTED +1.0 DEGREES (30 STATIONS) FROM
NORMAL FOR THE PACIFIC NORTHWEST RELATIVE TO 1961-1990 NORMALS.
MEAN TEMPERATURE DEPARTURES RANGED BETWEEN 4.8 AND -2.9 DEGREES.
PORTLAND BROKE RECORD HIGHS ON THE 28TH (82) AND THE 30TH (90). BY THE
30TH, THE REGIONAL SNOW DEPTHS (IN INCHES) WERE: DIXIE, ID, 2; CRATER
LAKE NP, OR, 126; MT. RAINIER-PARADISE RS, WA, 148; STAMPEDE PASS, WA, 48.

FAR-REACHING EXTENDED TROUGHS FROM ALASKA DOMINATED THE PACIFIC
NORTHWEST WITH COLD, CLOUDS, AND RAIN THROUGH THE 20TH. A RIDGE
BUILT FROM THE SOUTHWEST DURING THE 21ST - 23RD AND RETREATED FOR A
FEW DAYS AS ONE LAST ALEUTIAN LOW SWEPT TROUGH. AN INCREDIBLY
STRONG THERMAL LOW MOVED UP FROM THE SOUTHWEST BY THE 27TH AND
THE NORTHWEST BASKED IN 80 - 90 DEGREE TEMPERATURES. SNOW-MELT
PROCESSES COMMENCED FAST AND FURIOUSLY! AS A RESULT, THE PORTNEUF
RIVER AT POCATELLO FLOODED.

FOR APRIL...PRECIPITATION WAS 82 PERCENT OF NORMAL (1961-1990) AT
COLUMBIA ABOVE COULEE; 102 PERCENT OF NORMAL AT THE SNAKE RIVER
ABOVE ICE HARBOR; AND 89 PERCENT AT COLUMBIA ABOVE THE DALLES.

*** Includes late precip reports ***

end/nwrfc/kmartin

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ZCZC PDXESPPDR
TTAA00 KPDR 141948

SEASONAL
WATER SUPPLY FORECASTS
ISSUED BY
NATIONAL WEATHER SERVICE
NORTHWEST RIVER FORECAST CENTER
PORTLAND OREGON

MAY-98MIDMN 1 W A T E R S U P P L Y F O R E C A S T S
OBS PREC THRU 11TH; NORMAL PREC REST OF PERIOD

STREAM AND STATION	PERIOD	FORECAST	% AVERAGE
COLUMBIA RIVER			
MICA RESERVOIR INFLOW, BC	FEB-SEP	11600.0	88 13170.
	APR-SEP	11100.0	87 12730.
ARROW LAKES INFLOW	FEB-SEP	22500.0	84 26800.
	APR-SEP	21100.0	83 25540.
BIRCHBANK, BC (1)	APR-SEP	36200.0	83 43800.
GRAND COULEE, WA (1)	JAN-JUL	52400.0	83 63280.
	APR-SEP	52200.0	80 64850.
ROCK ISLAND DAM BLO, WA (1)	APR-SEP	57700.0	82 70480.
THE DALLES NR, OR (1)	APR-SEP	78900.0	80 98980.
	JAN-JUL	88200.0	83 105900.
KOOTENAI RIVER			
LIBBY RES INFLOW, MT (1)	APR-SEP	5240.0	77 6772.
KOOTENAY RIVER			
KOOTENAY LAKE INFLOW, BC	APR-SEP	13300.0	80 16650.
DUNCAN RIVER			
DUNCAN RESERVOIR INFLOW, BC	FEB-SEP	2090.0	90 2319.
	APR-SEP	2000.0	89 2238.
CLARK FORK			
ST. REGIS, MT (1)	APR-SEP	2670.0	65 4095.
PEND OREILLE RIVER			
PEND OREILLE LAKE IN, ID (1)	APR-SEP	8990.0	63 14370.
S.F. FLATHEAD RIVER			
HUNGRY HORSE RES IN, MT (1)	APR-SEP	1440.0	66 2184.
FLATHEAD RIVER			
FLATHEAD LAKE INFLOW, MT (1)	APR-SEP	4560.0	66 6926.
COEUR D'ALENE RIVER			
COEUR D'ALENE LAKE IN, ID	APR-SEP	1590.0	58 2720.
SIMILKAMEEN RIVER			
NIGHTHAWK NR, WA (1)	APR-JUL	950.0	73 1304.
OKANAGAN RIVER			
TONASKET NR, WA (1)	APR-SEP	1240.0	76 1623.
CHELAN RIVER			
LAKE CHELAN INFLOW, WA (1)	APR-SEP	1140.0	98 1160.
YAKIMA RIVER			
PARKER NR, WA	APR-SEP	1780.0	89 1994.
SKAGIT RIVER			
CONCRETE NR, WA	APR-SEP	5580.0	86 6525.
COWLITZ RIVER			
MAYFIELD RES INFLOW, WA	APR-SEP	1680.0	85 1971.
	APR-JUL	1480.0	85 1731.
CASTLE ROCK, WA	APR-SEP	2280.0	85 2668.
SNAKE RIVER			
JACKSON LAKE INFLOW, WY (1)	APR-JUL	740.0	95 781.
PALISADES RES INFLOW, ID (1)	APR-JUL	3020.0	94 3226.
HEISE NR, ID	APR-JUL	3200.0	93 3451.
WEISER, ID (1)	APR-JUL	4840.0	89 5465.
BROWNLEE RES INFLOW	APR-JUL	5120.0	88 5794.
LOWER GRANITE RES IN, WA (1)	JAN-JUL	25700.0	86 29740.
	APR-JUL	18000.0	83 21650.
TETON RIVER			
ST. ANTHONY NR, ID	APR-JUL	360.0	95 380.
HENRYS FORK			
REXBURG NR, ID	APR-JUL	1120.0	92 1219.
PORTNEUF RIVER			
TOPAZ, ID	APR-SEP	100.0	108 93.
BIG LOST RIVER			
MACKAY RESERVOIR INFLOW, ID	APR-JUL	149.0	99 150.
BIG WOOD RIVER			
HAILEY, ID (1)	APR-JUL	215.0	85 254.
MAGIC RESERVOIR INFLOW, ID	APR-JUL	230.0	78 295.
LITTLE WOOD RIVER			
CAREY NR, ID	APR-JUL	86.0	93 92.
OWYHEE RIVER			
OWYHEE RES INFLOW, OR	MAR-JUL	530.0	93 567.
BOISE RIVER			
BOISE NR, ID (1)	APR-JUL	1210.0	85 1421.
MALHEUR RIVER			
DREWSEY NR, OR	MAR-JUL	128.0	124 103.

N.F. MALHEUR RIVER					
BEULAH RES INFLOW, OR (1)	MAR-JUL	87.0	114	76.	
PAYETTE RIVER					
HORSESHOE BEND NR, ID (1)	APR-JUL	1520.0	94	1618.	
WEISER RIVER					
WEISER NR, ID (1)	APR-JUL	360.0	93	386.	
POWDER RIVER					
SUMPTER NR, OR	MAR-JUL	62.0	93	67.	
SALMON RIVER					
WHITEBIRD, ID (1)	APR-JUL	5640.0	95	5956.	
GRANDE RONDE RIVER					
LA GRANDE, OR	MAR-JUL	178.0	82	218.	
TROY, OR (1)	MAR-JUL	1280.0	87	1471.	
CLEARWATER RIVER					
OROFINO, ID (1)	APR-JUL	3250.0	69	4718.	
N.F. CLEARWATER RIVER					
DWORSHAK RES INFLOW, ID (1)	APR-JUL	1670.0	62	2700.	
	APR-SEP	1780.0	62	2874.	
CLEARWATER RIVER					
SPALDING, ID (1)	APR-JUL	5190.0	68	7618.	
	APR-SEP	5510.0	68	8052.	
UMATILLA RIVER					
GIBBON NR, OR	APR-JUL	58.0	83	70.	
PENDLETON, OR	APR-JUL	108.0	77	141.	
S.F. WALLA WALLA RIVER					
MILTON NR, OR	APR-JUL	51.0	96	53.	
M.F. JOHN DAY RIVER					
RITTER, OR (1)	APR-JUL	94.0	81	116.	
N.F. JOHN DAY RIVER					
MONUMENT NR, OR	APR-JUL	525.0	93	567.	
JOHN DAY RIVER					
SERVICE CREEK, OR (1)	APR-SEP	705.0	86	821.	
DESCHUTES RIVER					
BENHAM FALLS, OR	APR-SEP	555.0	105	529.	
CROOKED RIVER					
PRINEVILLE RES INFLOW, OR	MAR-JUL	191.0	112	171.	
OCHOCO CREEK					
OCHOCO RES INFLOW, OR	MAR-JUL	34.0	103	33.	
S. SANTIAM RIVER					
WATERLOO, OR	APR-SEP	425.0	74	576.	
N. SANTIAM RIVER					
MEHAMA, OR	APR-SEP	660.0	79	832.	
WILLAMETTE RIVER					
SALEM, OR	APR-SEP	3840.0	82	4670.	
CLACKAMAS RIVER					
ESTACADA, OR	APR-SEP	690.0	93	742.	
MCKENZIE RIVER					
VIDA NR, OR	APR-SEP	940.0	79	1184.	
ROGUE RIVER					
RAYGOLD, OR	APR-SEP	855.0	99	868.	
SILVIES RIVER					
BURNS NR, OR	APR-SEP	110.0	122	90.	

THESE FORECASTS ARE SELECTED FROM THOSE PREPARED BY: NATIONAL WEATHER SERVICE, NATURAL RESOURCE CONSERVATION SERVICER, AND B.C. HYDRO AND POWER AUTHORITY. FOR VARIOUS PROJECT INFLOWS, THE FORECASTS HAVE BEEN COORDINATED WITH THE COLUMBIA RIVER FORECAST SERVICE AND THE U.S. BUREAU OF RECLAMATION.

ALL FORECASTS ARE IN THOUSANDS OF ACRE-FEET

ALL AVERAGES ARE FOR THE PERIOD 1961 THROUGH 1990

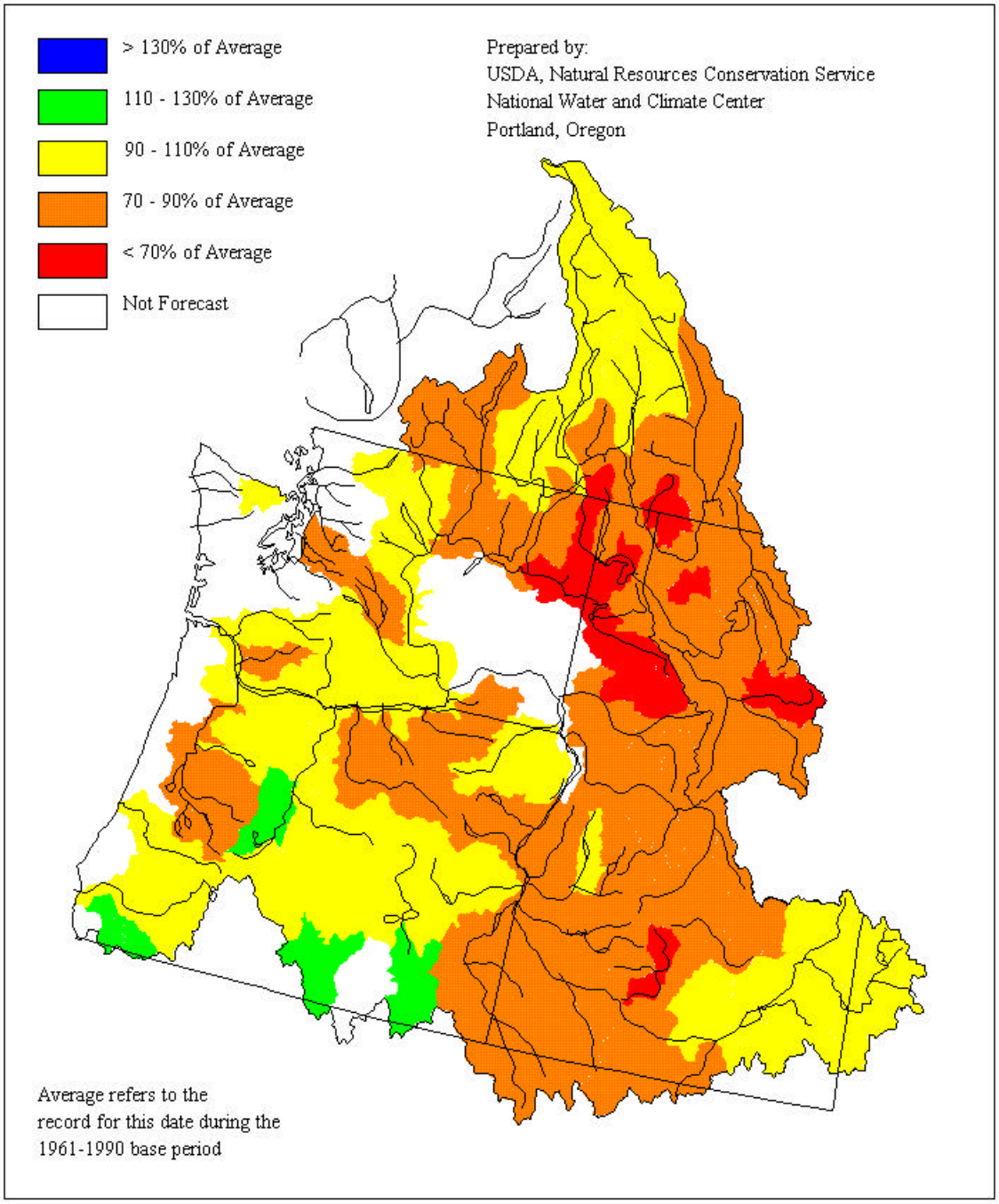
END.....NOAA/NWS/NORTHWEST RFC.....

NNNN

Back

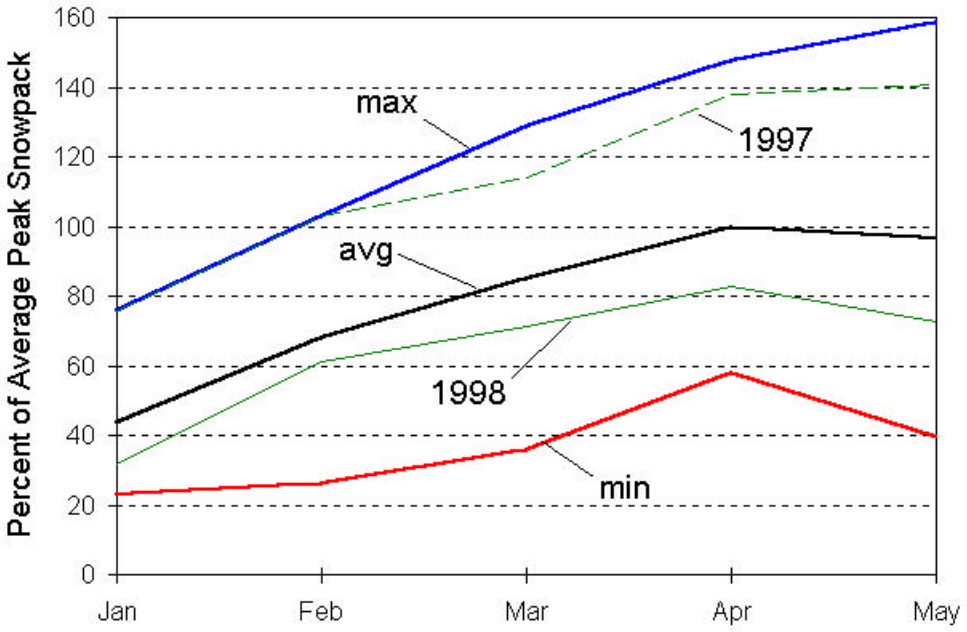
Spring and Summer Streamflow Forecasts

as of April 1, 1998 (in relation to the average for this date)



United States Department of Agriculture -- Natural Resources Conservation Service
in cooperation with
United States Department of Commerce, NOAA -- National Weather Service

Columbia Basin Snowpack Summary



May 1, 1998

From British Columbia south, through all of Idaho, snowpack percents of average dropped sigificantly in April. The largest decreases were in the Kootenay, down 17% to 62% and Spokane, down 17% to 55%, the latter now holding the worst snowpack in the Columbia. The Clearwater also dropped 7% to 62%. Further south in Idaho decreases were less significant, with the Salmon dropping only 1% to 78%, the Boise and Payette dropping only 3% to 79%.

Meanwhile, small gains were seen elsewhere in the Columbia Basin. The upper Snake in Wyoming gained 1% to 92%, and the Snake in Eastern Oregon gained 4% to 99%. In Washington, the North Cascades gained 2% to 106% and the Yakima gained 3% to 115%, the latter retaining the highest snowpack in the Columbia.

The remainder of Oregon's Columbia drainage saw drops of 5-7 percent, with the John Day now holding 68% and the Deschutes at 83%. Overall, the snowpack for the Columbia above the Dalles is 73 percent of the normal peak accumulation. This is about half of last year at this time (141%).

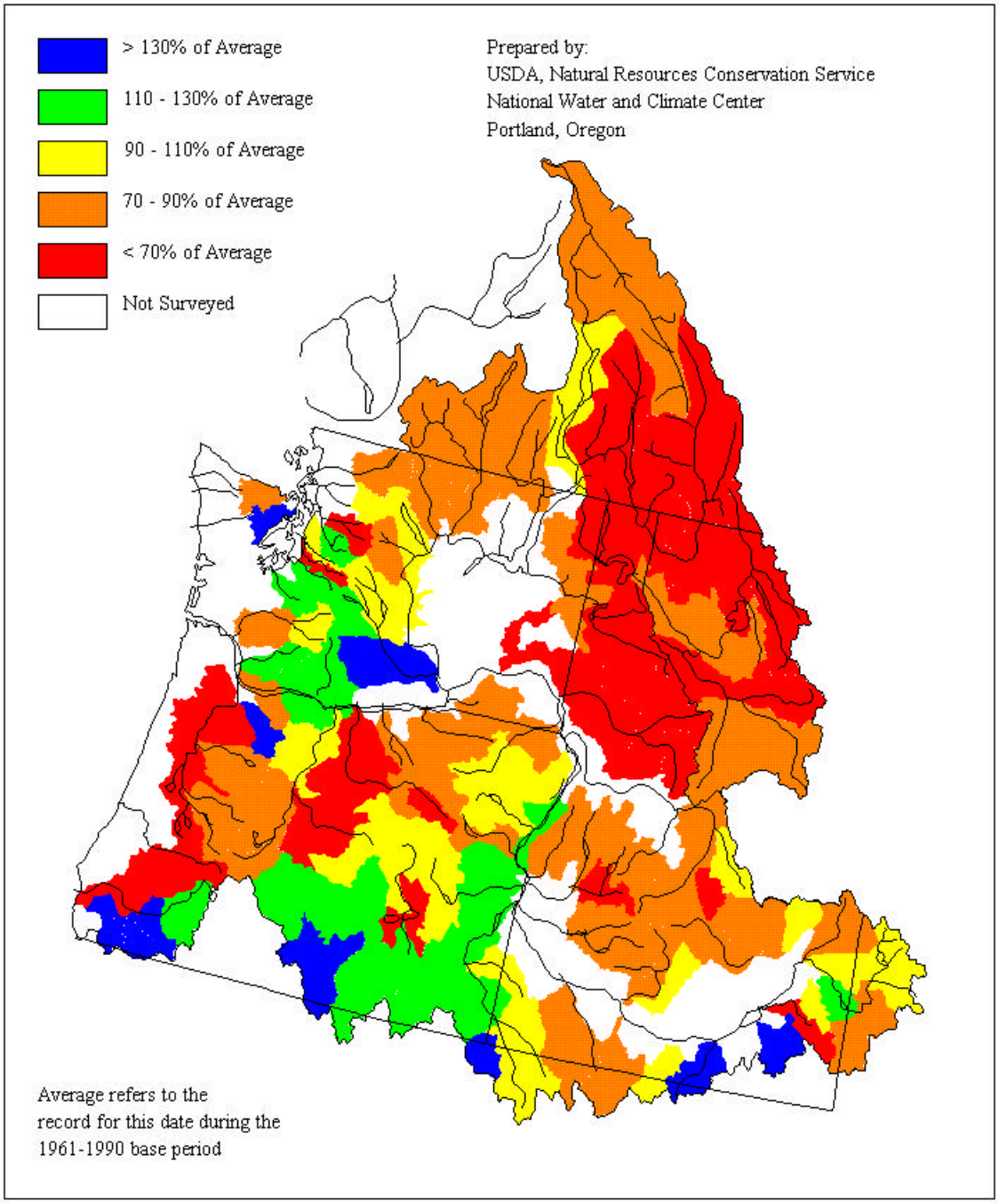
The snowpack year seems to have been saved by a productive January. Thirty percent of a year's normal accumulation was attained in that one month. In addition, the Canadian snowpack was less impacted by El Niño than it could have been, continually tracking over 10% higher than neighboring basins to the south.

Dan Moore
Columbia River Basin Hydrologist
Natural Resources Conservation Service
National Water and Climate Center
101 SW Main Street, Suite 1600
Portland, OR 97204-3224
(503) 414-3054

dmoore@wcc.nrcs.usda.gov

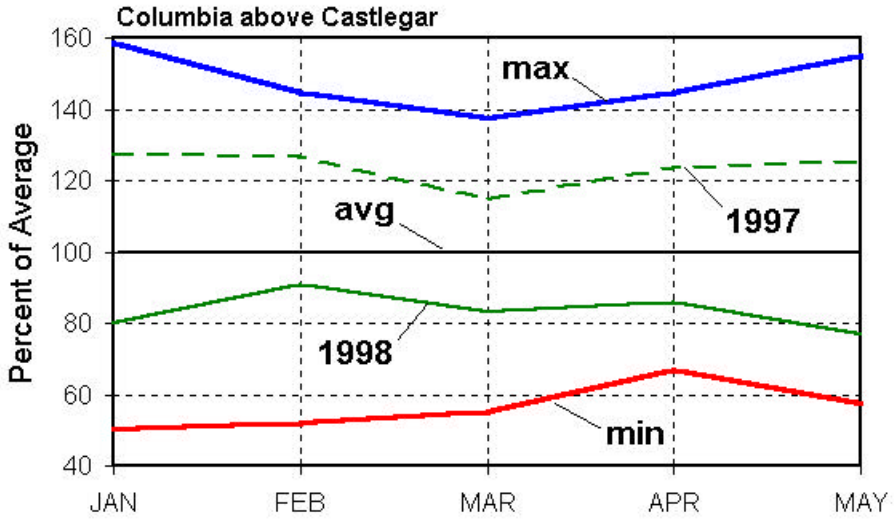
Mountain Snow Water Equivalent

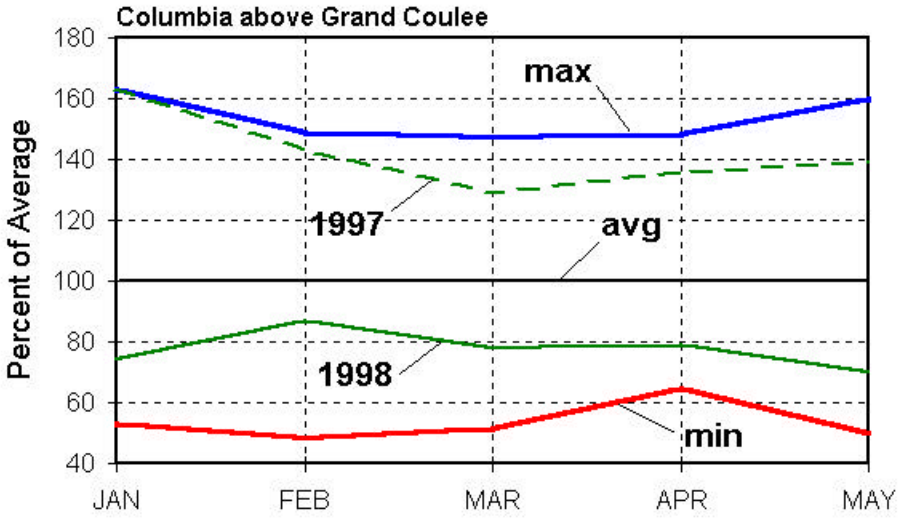
as of May 1, 1998 (in relation to the average for this date)

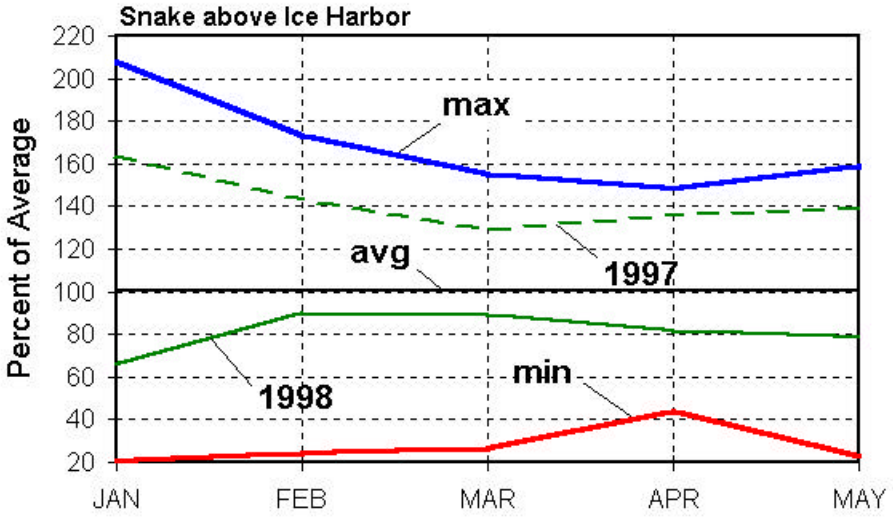


United States Department of Agriculture -- Natural Resources Conservation Service
in cooperation with
The Province of British Columbia -- Ministry of the Environment

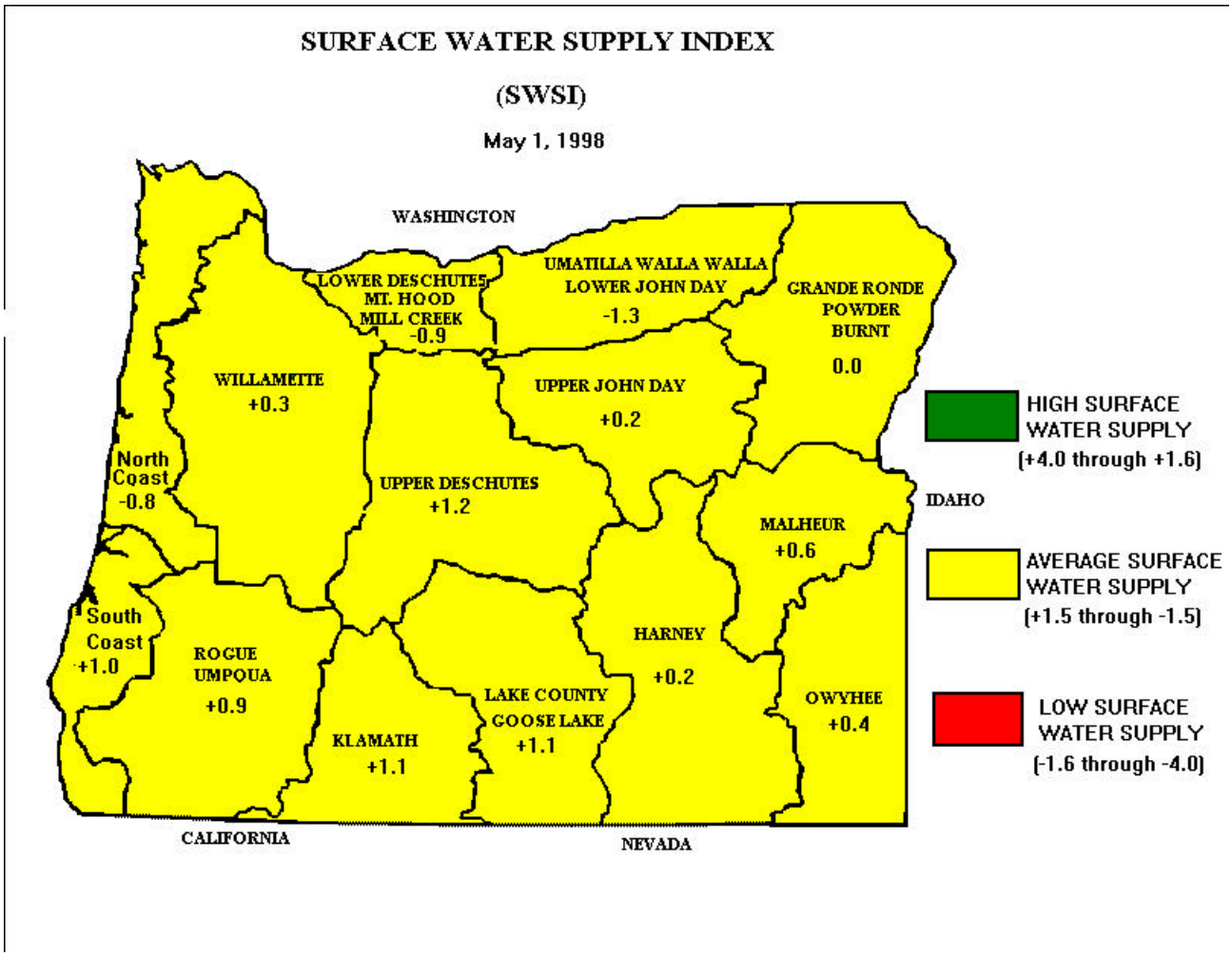
Columbia Sub-Basin Snowpack Graphs - May 1, 1998







Dan Moore


SURFACE WATER SUPPLY INDEX
(SWSI)
May 1, 1998
WASHINGTON
LOWER DESCHUTES
MT. HOOD
MILL CREEK
-0.9
UMATILLA WALLA WALLA
LOWER JOHN DAY
-1.3
GRANDE RONDE
POWDER
BURNT
0.0
WILLAMETTE
+0.3
UPPER JOHN DAY
+0.2
North
Coast
-0.8
UPPER DESCHUTES
+1.2
IDAHO
MALHEUR
+0.6
South
Coast
+1.0
ROGUE
UMPQUA
+0.9
HARNEY
+0.2
LAKE COUNTY
GOOSE LAKE
+1.1
OWYHEE
+0.4
KLAMATH
+1.1
CALIFORNIA
NEVADA
HIGH SURFACE
WATER SUPPLY
(+4.0 through +1.6)
AVERAGE SURFACE
WATER SUPPLY
(+1.5 through -1.5)
LOW SURFACE
WATER SUPPLY
(-1.6 through -4.0)

DWORSHAK APRIL-JULY INFLOW FORECAST
Run Date is 4 MAY 1998

	1NOV	1DEC	1JAN	1FEB	1MAR	1APR	1MAY	1JUN
ELBI ELK BUTTE	.2	5.2	9.8	20.5	25.3	27.0	19.6	
HEMI HEMLOCK	.3	6.8	13.0	23.9	28.5	32.0	28.3	
HOOM HOODOO BASIN	.3	7.8	12.3	23.6	27.3	31.4	31.5	
PIRI PIERCE RG S			3.2	6.0	6.0			
SHAI SHANGHI SUM	.2	4.9	9.4	18.1	21.8	20.8	9.8	
LSLI LOST LAKE	4.3	10.3	15.5	29.0	33.9			
EKRI ELK RIVER 1S			3.4					
DWR AVERAGE KAF	137	193	171	223	370	510		
ASOI July-Aug SOI	-3	-3	-3	-3	-3	-3		
SSOI July-Sep SOI	-5	-5	-5	-5	-5	-5		
OSOI July-Oct SOI	-6	-6	-6	-6	-6	-6		
NSOI July-Nov SOI		-8	-8	-8	-8	-8		
DSOI July-Dec SOI			-9	-9	-9	-9		
DWORSHAK FC SPACE			700	730	600	200		
DWORSHAK FC ELEV			1558	1556	1565	1589		
DWORSHAK FOM ELEV	1500	1500	1505	1513	1524	1545	1562	

ELBI = ELK BUTTE ACCUMULATED SWE IN INCHES (snotel) elev 5550
HEMI = HEMLOCK ACCUMULATED SWE IN INCHES (snotel) elev 5810
HOOM = HOODOO BASIN ACCUMULATED SWE IN INCHES (snotel) elev 6050
PIRI = PIERCE RANGER STATION ACCUMULATED SWE IN INCHES (snow course)
LSLI = LOST LAKE ACCUMULATED SWE IN INCHES (snotel) elev 6110
EKRI = ELK RIVER 1S ACCUMULATED MONTHLY PRECIP IN INCHES elev 2910
DWRI = MONTHLY DWORSHAK INFLOW (KAF)
JD = JANUARY DWORSHAK INFLOW (KAF)
FD = FEBRUARY DWORSHAK INFLOW (KAF)
MD = MARCH DWORSHAK INFLOW (KAF)
AD = APRIL DWORSHAK INFLOW (KAF)

Back

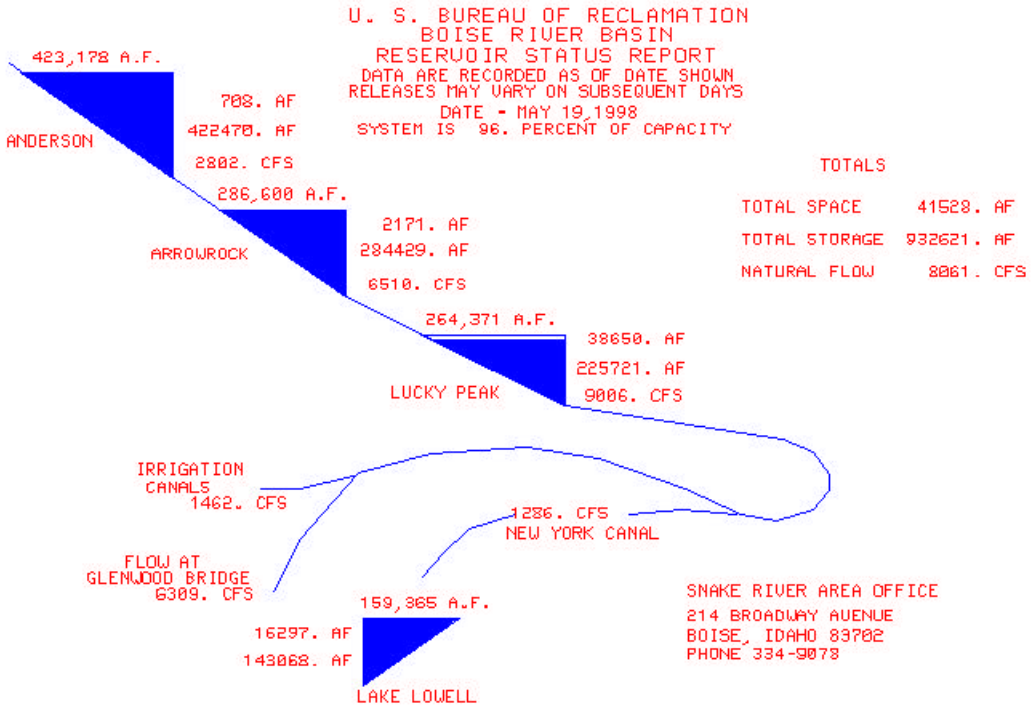
FORECAST EQUATIONS:
01OCT=276.4*ASOI+2690
01NOV=191.5*SSOI+2667
01DEC=144.2*OSOI+2687
01JAN=12.7*ELBI+15.3*HEMI+13.3*HOOM+63.3*PIRI+89.7*NSOI+17.1*EKRI+1539
01FEB=18.6*ELBI+15.6*HEMI+18.5*HOOM+44.1*PIRI+20.3*DSOI+.8*JD+540
01MAR=14.2*ELBI+14.7*HEMI+15.5*HOOM+33.4*PIRI+21.8*DSOI+.9*JD+.2*FD+369
01APR=15.1*ELBI+15.4*HEMI+14.6*HOOM+15.9*SHAI+22.6*DSOI+.8*JD+.3*FD+.3*MD-168
01MAY=14.1*ELBI+12.3*HEMI+12.6*HOOM+13.9*SHAI+.3*AD-201
01JUN=8.2*ELBI+7.3*HEMI+8.4*HOOM+5.7*LSLI+183

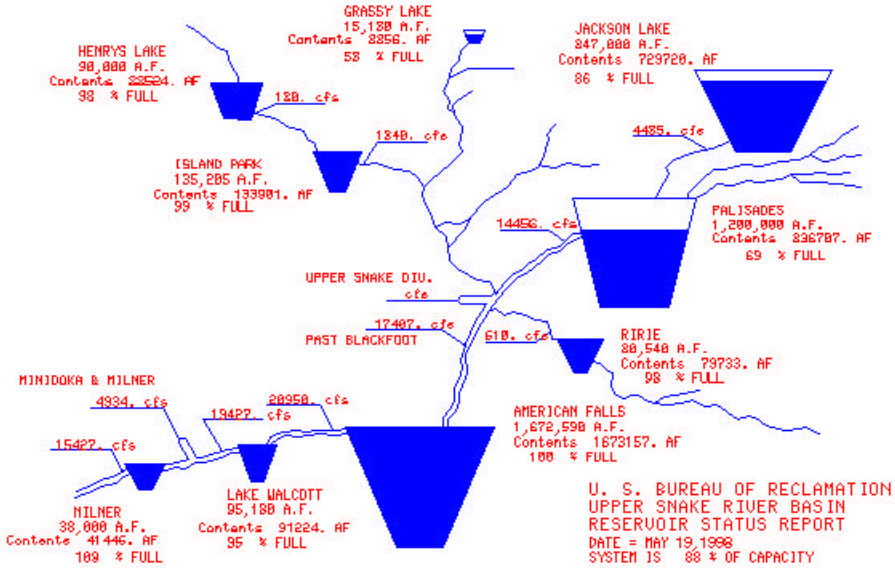
April-July Average inflow 2700 KAF

	% Chance that OBSERVED will be > than given value						
	1%	5%	20%	50%	80%	95%	99%
01Oct April-July Forecast 1833 KAF	3539	3034	2448	1833	1218	632	127
01Nov April-July Forecast 1786 KAF	3412	2931	2372	1786	1200	641	160
01Dec April-July Forecast 1764 KAF	3419	2929	2361	1764	1167	599	109
01Jan April-July Forecast 1587 KAF	2907	2516	2063	1587	1111	658	267
01Feb April-July Forecast 1943 KAF	2926	2635	2297	1943	1589	1251	960
01Mar April-July Forecast 1765 KAF	2593	2348	2063	1765	1467	1182	937
01Apr April-July Forecast 1633 KAF	2275	2085	1864	1633	1402	1181	991
01May April-July Forecast 1620 KAF	2223	2044	1837	1620	1402	1195	1016

The given forecast values are to be considered the Corps of Engineers
Official Forecast for Dworshak. If you have questions on this report,
contact:
Jim.D.Versteeg@nwd01.npd.usace.army.mil

Date: 18:17:37 UT on Thu 21 May 98.


U. S. BUREAU OF RECLAMATION
BOISE RIVER BASIN
RESERVOIR STATUS REPORT
DATA ARE RECORDED AS OF DATE SHOWN
RELEASES MAY VARY ON SUBSEQUENT DAYS
DATE - MAY 19,1998
SYSTEM IS 96. PERCENT OF CAPACITY
423,178 A.F.
708. AF
422470. AF
ANDERSON
2802. CFS
286,600 A.F.
2171. AF
284429. AF
ARROWROCK
6510. CFS
264,371 A.F.
38650. AF
225721. AF
LUCKY PEAK
9006. CFS
TOTALS
TOTAL SPACE 41528. AF
TOTAL STORAGE 932621. AF
NATURAL FLOW 8061. CFS
IRRIGATION
CANALS
1462. CFS
1286. CFS
NEW YORK CANAL
FLOW AT
GLENWOOD BRIDGE
6309. CFS
159,365 A.F.
16297. AF
143068. AF
LAKE LOWELL
SNAKE RIVER AREA OFFICE
214 BROADWAY AVENUE
BOISE, IDAHO 83702
PHONE 334-9073


GRASSY LAKE
15,180 A.F.
Contents 8256. AF
53 % FULL
HENRYS LAKE
90,000 A.F.
Contents 88504. AF
98 % FULL
130. cfs
1848. cfs
ISLAND PARK
135,285 A.F.
Contents 133901. AF
99 % FULL
JACKSON LAKE
847,000 A.F.
Contents 729720. AF
86 % FULL
4485. cfs
PALISADES
1,200,000 A.F.
Contents 836787. AF
69 % FULL
14456. cfs
UPPER SNAKE DIV.
cfs
17407. cfs
PAST BLACKFOOT
610. cfs
RIRIE
80,540 A.F.
Contents 79733. AF
98 % FULL
MINIDOKA & MILNER
4934. cfs
20950. cfs
19422. cfs
15422. cfs
AMERICAN FALLS
1,672,590 A.F.
Contents 1673157. AF
100 % FULL
LAKE WALCOTT
95,180 A.F.
Contents 91224. AF
95 % FULL
MILNER
38,000 A.F.
Contents 41446. AF
109 % FULL
U. S. BUREAU OF RECLAMATION
UPPER SNAKE RIVER BASIN
RESERVOIR STATUS REPORT
DATE = MAY 19,1998
SYSTEM IS 88 % OF CAPACITY

WATER CONDITIONS REPORT - PN REGION

RESERVOIR STORAGE - April, 1998

End of Month Reservoir Contents (1000 AF):

STATION - CODE	ACTIVE CAPACITY	APR 1998	APR % OF CAPACITY	APR AVG	APR % OF AVG
HGH-AF-HUNGRY HORSE DAM & R	2981.20	2104.59O	71	1595.97	132
CMO-AF-COMO DAM AND LAKE ON	35.10	26.34V	75	19.91	132
Yakima River Basin					
CLE-AF-CLE ELUM LAKE, WA	436.90	406.71O	93	295.90R	137
KAC-AF-KACHESS LAKE, WA	239.00	214.77O	90	194.20	111
KEE-AF-KEECHELUS LAKE, WA	157.80	149.97O	95	114.00	132
RIM-AF-TIETON DAM & RIMROCK	198.00	165.09O	83	136.80	121
BUM-AF-BUMPING LAKE, WA	33.70	21.20O	63	11.60R	183
Columbia Basin					
GCL-AF-GRAND COULEE DAM & F	5185.45	4160.49V	80	1108.60	375
BNK-AF-BANKS LAKE NR GRAND	715.00	****	***	498.24	***
POT-AF-O'SULLIVAN DAM & POT	332.20	****	***	261.55	***
Okanogan River Basin					
CCR-AF-CONCONULLY DAM & RES	13.00	****	***	8.39	***
CCL-AF-SALMON LK DAM & CONC	10.50	****	***	8.52	***
Snake River Basin					
JCK-AF-JACKSON LAKE NEAR MO	847.00	663.17V	78	456.46	145
PAL-AF-PALISADES RESERVOIR	1200.00	710.56V	59	749.73	95
ISL-AF-ISLAND PARK RESERVOI	135.20	130.38V	96	126.04	103
GRS-AF-GRASSY LAKE NR MORAN	15.20	7.51V	49	11.70	64
RIR-AF-RIRIE RESERVOIR NEAR	80.50	66.19V	82	53.48E	124
AMF-AF-AMERICAN FALLS RES A	1672.60	1550.86V	93	1545.67	100
MIN-AF-MINIDOKA DAM & LAKE	95.20	95.30V	100	94.37	101
WOD-AF-LITTLE WOOD RESERVOI	30.00	25.90V	86	25.24	103
Boise River Basin					
AND-AF-ANDERSON RANCH RES A	423.20	322.04V	76	286.00	113
ARK-AF-ARROWROCK RESERVOIR	286.60	278.04V	97	203.96	136
LUC-AF-LUCKY PEAK LAKE NEAR	264.40	217.16V	82	163.83	133
LOW-AF-LAKE LOWELL, ID	169.10	134.90V	80	151.40	89
Payette River Basin					
CSC-AF-CASCADE RESERVOIR AT	653.00	522.91V	80	380.52	137
DED-AF-DEADWOOD RESERVOIR N	161.90	126.30V	78	102.64	123
Weiser River Basin					
MAN-AF-MANN CR DAM & RES ON	11.10	11.02V	99	9.96E	111
Clearwater River Basin					
RES-AF-LEWISTON ORCHARDS RE	3.00	1.66V	55	3.08E	54
SOL-AF-SOLDIERS MEADOW DAM,	2.37	****	***	1.63E	***
Owyhee River Basin					
OWY-AF-LAKE OWYHEE NEAR NYS	715.00	652.50V	91	607.35	107
WLD-AF-WILDHORSE RESERVOIR	71.50	72.49V	101	47.20	154
Malheur River Basin					
BEU-AF-AGENCY VALLEY DAM &	59.90	59.47V	99	50.22	118
BUL-AF-BULLY CREEK RESERVOI	30.00	30.43V	101	25.23E	121
WAR-AF-WARM SPRINGS RESERVO	191.00	181.91V	95	145.56	125
Powder River Basin					
PHL-AF-MASON DAM & PHILLIPS	73.50	62.95V	86	58.61E	107
THF-AF-THIEF VALLEY RESERVO	17.40	13.66V	79	17.46E	78
Burnt River Basin					
UNY-AF-UNITY RESERVOIR NEAR	25.20	24.62V	98	24.58	100
Umatilla River Basin					
MCK-AF-MCKAY RESERVOIR NR P	66.26	60.90V	92	58.65	104
CLS-AF-COLD SPRINGS DAM & R	38.33	28.49V	74	46.82	61
Deschutes River Basin					
CRA-AF-CRANE PRAIRIE DAM &	55.30	53.85V	97	44.04	122
CRE-AF-CRESCENT LK DAM & LK	86.90	80.85V	93	56.69	143

WIC-AF-WICKIUP DAM & RES ON	200.00	193.77V	97	189.90	102
OCH-AF-OCHOCO DAM & RES ON	45.24	42.89V	95	39.09	110
PRV-AF-ARTHUR R BOWMAN DAM	152.80	154.54V	101	147.59	105
HAY-AF-HAYSTACK DAM & RES O	5.64	4.30V	76	5.02E	86
WAS-AF-WASCO DAM & CLEAR LA	11.90	6.98V	59	6.80	103
Rogue River Basin					
AGA-AF-AGATE DAM AND RES ON	4.70	4.69I	100	4.67E	100
EMI-AF-EMIGRANT DAM & LK ON	39.00	38.93V	100	37.02	105
FIS-AF-FISH LK NR LAKE CR,	7.90	7.68V	97	6.06E	127
FOR-AF-FOURMILE LAKE, OR	15.60	14.80V	95	10.54E	140
HPD-AF-HOWARD PRAIRIE DAM &	60.60	62.11V	102	51.60E	120
HYA-AF-HYATT DAM & RES NR A	16.00	16.60V	104	14.02E	118
Tualatin River Basin					
SCO-AF-SCOGGINS DAM AND HEN	53.60	53.59V	100	52.23E	103
TOTAL OF 48 RESERVOIRS	17358.41	14036.09	81	9588.01	146

AF is acre-feet.
AVG is published 30-year average, 1961-1990.
Please note that all data are PROVISIONAL and subject to revision.
This report is updated monthly, after the 15th of each month.

Back

18-MAY-98 08:03:59 U.S.BUREAU OF RECLAMATION
YAKIMA PROJECT
SYSTEM STATUS AT 08:00

RESERVOIR	CONTENT	TOTAL CAPACITY	PERCENT CAPACITY	RESERVOIR INFLOW	RESERVOIR RELEASES
	AF	AF	%	CFS	CFS
Keechelus	152440.	157800.	97.	517.	404.
Kachess	238710.	239000.	100.	478.	365.
Cle Elum	434828.	436900.	100.	1369.	1688.
Bumping	35048.	33700.	104.	510.	580.
Rimrock	196506.	198000.	99.	849.	928.
TOTALS	1057532.	1065400.	99.	3725.	3965.

Back

IRRIGATION DIVERSIONS	CFS		RIVER FLOWS		CFS
Kittitas	827.		Yakima River near Easton		357.
Roza	738.		Yakima River at Cle Elum		2580.
Yakima-Tieton	170.	EST	Teanaway River bl. Forks		373.
Wapato	1710.		Yakima River at E'Burg	EST	3000.
Sunnyside	1192.		Yakima River at Umtanum		3842.
			Naches River nr. Clf'Del		2024.
MAJOR USERS TOTAL	4637.		Tieton R. bl. Can. Hdwks		794.
			Naches River nr. Naches		2781.
Westside	75.		Yakima River at Parker		4249.
Naches-Selah	121.		Yakima River at Prosser	EST	4600.
OTHERS ABOVE PARKER	1100.				
TOTAL ABOVE PARKER	5737.				
Kennewick	267.				

OTHER CANAL DIVERSIONS

Wapatox	458.
Roza	1942.
Chandler	1347.

UNREGULATED TRIBUTARY & RETURN FLOW ABOVE PARKER - - 6021. CFS

OPERATIONAL COMMENTS:

CLE ELUM -- CUT BACK 200 CFS.,
RIMROCK -- CUT BACK 200 CFS.,
KACHESS -- CUT BACK 30 CFS.,
MAY'S PRECIP. TO-DATE IS 21% OF MONTH'S AVERAGE. (THUNDER STORMS)
NOTE: FROM 5/1 TO 5/17, 318534 AF OF RUNOFF HAS PASSED OVER YAKIMA RIVER @ PARKER GAGE SITE.
HAPPY MOUNT ST. HELENS DAY...